Patent claims

Sub A1

1.
An illuminated sign or panel arrangement, e.g., for traffic information, advertising, other information, decoration etc., characterised by
- at least one clear light distribution plate of transparent plastics material, e.g., acrylic, or glass, wherein one of the sides of the plate is provided with a plurality of substantially parallel grooves, and wherein the grooves extend wholly or partly along the length of the plate between a first and a second end thereof;
- at least one elongate light source device extending transverse to the parallel grooves; and
- a light diffuser plate or display film positioned adjacent to the other side of the light distribution plate and/or a light reflector plate or sheet positioned adjacent to the first side of the light distribution plate.

2.
An arrangement as disclosed in claim 1, characterised by
- a first and a second light distribution plate, wherein the grooved sides of the plates are placed adjacent to one another.

3.
An arrangement as disclosed in claim 2, characterised in
- that a light reflector plate or sheet is placed between the two light distribution plates.

4.
An arrangement as disclosed in claim 2 or 3, characterised in
- that a light diffuser plate or display film is placed adjacent to the non-grooved side of at least one of the light distribution plates.

5.
An arrangement as disclosed in one or more of preceding 2-4, characterised in
- that the light distribution plates on the grooved side thereof have at least one light source device receiving recess extending transverse to the grooves, so that when the grooved sides of the plates rest against one another opposite recesses will provide space for the light source device.

6.
An arrangement as disclosed in one or more of claims 1-5, characterised in
- that the light diffuser plate covers wholly or partly the non-grooved light distribution plate.

7.
An arrangement as disclosed in one or more of claims 1-6, characterised in
- that the light diffuser plate is covered by an opal plate.

8.
An arrangement as disclosed in one or more of the preceding claims, characterised in
- that the grooves have their termination a short distance from respective end edges of the light distribution plate(s).

9.
An arrangement as disclosed in claims 1-4 or 6-8, characterised in
- that one light source device is provided at one end edge of the light distribution plate(s).

10.
An arrangement as disclosed in claims 1-4 or 6-8, characterised in
- that a light source device is provided at a respective end edge of the two opposite end edges of the light distribution plate(s).

11.
An arrangement as disclosed in one or more of the preceding claims, characterised in
- that the width and/or depth of the grooves increases in the direction away from the light source device.

12.
An arrangement as disclosed in one or more of the preceding claims, wherein two light source devices are used, characterised in
- that the width and/or depth of the grooves, seen from each of the light source devices increases until about the midway point between the light source devices.

13.
An arrangement as disclosed in claim 12, characterised in
- that the width and/or depth of the grooves increases non-linearly.

14.
An arrangement as disclosed in claim 2, characterised in
- that the grooves in the first light distribution plate are parallel with and immediately above the grooves in the second light distribution plate.

15.
An arrangement as disclosed in claim 2, characterised in
- that the grooves in the first light distribution plate are parallel to, but laterally offset in relation to the grooves in the second light distribution plate.

16.
An arrangement as disclosed in any one of the preceding claims, characterised in
- that the light source device is a cold cathode tube.

17.
An arrangement as disclosed in any one of the preceding claims, characterised in
- that the light source device is a fluorescent tube.

18.
An arrangement as disclosed in any one of preceding claims 1-4 and 6-17, characterised in
- that the light source device consists of a plurality of light-emitting diodes placed side by side and arranged to beam in substantially the same direction, i.e., in the longitudinal direction of the grooves.

19.
An arrangement as disclosed in claim 18, characterised in
- that the heads of the light-emitting diodes are placed in a recess in the end edge portion of the light distribution plate.

20.
An arrangement as disclosed in claims 18 and 19, characterised in
- that the number of light-emitting diodes corresponds approximately to the number of grooves in the light distribution plate.

21.
An arrangement as disclosed in one or more of claims 1-4 and 6-17, characterised in
- that the light source device consists of a single light source which supplies plurality of optical fibres which at their output end have a beam direction substantially in the longitudinal direction of the grooves.

22.
An arrangement as disclosed in claim 21, characterised in
- that the output ends of the optical fibres rest against the end edge of the light distribution plate.

23.
An arrangement as disclosed in claim 21, characterised in
- that the output ends of the optical fibres are placed in a recess in the end edge portion of the light distribution plate.

24.
An arrangement as disclosed in one or more of the preceding claims, characterised in
- that the distance between the grooves in the light distribution plate is a function of the thickness of the plate, wherein
$d1 = d2 + k^* d3$,
wherein d1 is the groove distance, d2 is a fixed minimum groove distance, d3 is the thickness of the light distribution plate and k is a constant.

25.
An arrangement as disclosed in claim 24, characterised in
- that $k = 0.625$ and d2 is 1.5 mm.

26.

An arrangement as disclosed in one or more of the preceding claims, characterised in
- that the grooves have a greatest transverse dimension in the range of 0.3 - 2.5 mm, preferably in the range 0.4 - 0.8 mm.

27.

An arrangement as disclosed in claim 24, characterised in
- that d1 is 4.5 mm or 9.0 mm.

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An arrangement as disclosed in one or more of the preceding claims, characterised in
- that the thickness of the opal plate is 2 mm.